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Influence of Sense of Coherence, Spirituality, Social Support and Health Perception on Breast Cancer Screening Motivation and Behaviors in African American Women

Abstract: *Despite formidable barriers, some African American women (AAW) engage in breast cancer screening (BCS) behaviors. Understanding individual characteristics that allow AAW to overcome barriers to BCS is critical to reduce breast cancer mortality among AAW. A salutogenic model of health was used to evaluate the influence of sense of coherence, social support, spirituality and health perception on BCS motivation and behaviors in AAW, and to determine differences in these factors in AAW who participate in free BCS programs compared to AAW who do not. Findings revealed that greater levels of spirituality were significantly associated with greater motivation to practice BCS. Further, women who utilized free BCS programs reported significantly greater rates of both performing and of intent to perform breast self examinations (BSE) in the future, obtaining clinical breast exams and mammograms. Findings can inform the development of culturally specific programs to improve the utilization of BCS programs by AAW.*

Key Words: *African American Women, Breast Cancer Screening, Salutogenesis, Sense of Coherence, Spirituality*

African American Women (AAW) have a higher breast cancer mortality rate and a lower survival rate than any other racial or ethnic group. Research demonstrates that barriers, such as high costs and lack of health insurance, reduce mammography screening among AAW (Byrne, Smith Glasgow, & DeShields, 2011; Davis et al., 2012). Yet, despite these barriers, some AAW do access mammography and engage in breast cancer screening (BCS) behaviors. BCS includes mammography, clinical breast examination (CBE), and breast self examinations (BSE) (American Cancer Society, 2013a).

Understanding individual characteristics that motivate AAW to surmount barriers and adopt BCS behaviors can inform approaches to increase health behaviors. The salutogenic model of health focuses on factors that promote health, as opposed to those factors that increase risk for disease (Antonovsky, 1987). Salutogenesis emphasizes understanding individual differences in the ability to meet challenges, like barriers to BCS; and thus, offers a novel framework of health to investigate individual characteristics posited to motivate

AAW to rise above adversity and engage in health behaviors to maintain breast health (Antonovsky, 1979). Sense of coherence (SOC) is central to salutogenesis. Persons with greater SOC view life as more manageable and are more likely to take advantage of available resources. Spirituality, social support, and health perception are key determinants of SOC and can serve as resources to motivate women to adopt BCS activities (Antonovsky, 1987).

Breast Cancer Screening Behaviors in African American Women

To understand the disparity in breast cancer mortality rates among AAW, prior research evaluated attitudes, beliefs, and perceptions of AAW regarding BCS (Garmon Bibb, 2012; Underwood, 2007). In parallel, other research identified barriers that prevent AAW from receiving mammograms including: cost, physicians' failure to discuss mammography, lack of health insurance, fear of radiation, misconceptions that BCS is unnecessary, distrust of the health care system, pain, fear of a cancer diagnosis, low level of education or income, lack of regular physician or source of health care, older age, and cancer fatalism, beliefs and attitudes (Conway-Phillips & Underwood, 2009). Knowledge of these barriers led to establishment of programs designed to increase BCS among AAW (Russell et al., 2010). Yet, little is known about individual characteristics that motivate AAW to overcome barriers and engage in BCS (Klassen, Smith, Shariff-Marco, & Juon, 2008).

Conceptual Framework

Few studies have used Antonovsky's Salutogenic Model of Health (Antonovsky, 1987), to understand health behaviors of AAW (George, 1999; Gibson, 2003; Nyamathi, 1993). Yet, this model offers several unique advantages. Salutogenesis has its origins in exploring the issue: if two people are confronted by an identical stressor, one has the wherewithal to successfully meet the challenge and the other does not (Antonovsky, 1979). The salutogenic focus on the origins of health and resources for health, contrasts with the pathogenic view of health/disease, which emphasizes factors that impede the attainment of health. The salutogenic model views health as movement along a continuum between total health (ease) and ill health (dis-ease), and offers a model to explain how individuals remain at a given point or move along the health continuum over time (Antonovsky, 1979; 1987). Antonovsky endorsed the use of

salutogenesis by nurses, as a viable model for health promotion research and practice (Antonovsky, 1996). Recent investigations have applied this model to address health promotion in various populations (Wainwright et al., 2007), including breast cancer survivors (Gibson, 2003) and the chronically ill (Delgado, 2007).

Salutogenesis incorporates three key concepts: problem solving/finding solutions, Generalized Resistance Resources (GRRs), and sense of coherence (SOC) (Eriksson, 2007). It posits a "recursive relation between SOC and GRR," in that GRRs facilitate the development of SOC; whereas a strong SOC helps to mobilize and utilize GRRs to manage life challenges (Horsburgh, 2000). Nurses practicing from a salutogenic orientation can strengthen individuals' resistance resources to promote and reinforce a SOC (Sullivan, 1989). Moreover, the value of this model in AAW has been demonstrated in health behavior studies (George, 1999; Nyamathi, 1993).

SOC is defined as a global orientation that expresses the extent to which one has a pervasive, enduring though dynamic feeling of confidence that life's events are comprehensible, manageable, and meaningful (Antonovsky, 1987). SOC is a relatively stable attribute that shapes an individual's enduring view of the world and determines how they perceive their lives and use the resources available to them. Antonovsky (1987) hypothesized that the stronger an individual's SOC, the more likely they are to engage in health-promoting activities. SOC, buttressed by GRRs like spirituality and social support, may explain why individuals in adverse situations stay well and are even able to improve their health.

GRRs are potential resources that those with a strong SOC can use to solve problems (Antonovsky, 1987). The extent to which GRRs are available to a person is a major determinant of their SOC. For AAW facing barriers to BCS, it is theorized that greater lifetime accessibility of GRRs contributes to a strong SOC, which will enable them to take advantage of available resources and practice BCS behaviors. Also, greater social support, spirituality and health perception are significant GRRs that can strengthen SOC. Although researchers have explored associations between SOC and GRRs in other populations (Delgado, 2005); few studies have evaluated SOC and GRRs in AAW (George, 1999; Gibson, 2003; Nyamathi, 1993). However, a handful of studies show that spirituality and social support are associated with health seeking behaviors that positively influence BCS behaviors among AAW (Banning, 2011; Gullatte, Brawley, Kinney, Powe, & Mooney, 2010; Holt, Lee, & Wright, 2008; Katz, Kauffman, Tatum, & Paskett, 2008). Yet, no studies used a salutogenic model to explore associations among SOC and GRRs (social support, spirituality, and health perception) and the influence of these variables on BCS motivation and behavior in AAW.

Purpose

The purpose of this study was to use a salutogenic model to evaluate the contribution of SOC, social support, spirituality, and health perception to BCS motivation and BCS behaviors in AAW, and to determine if there are differences in these variables in AAW who utilize free BCS programs compared to AAW who do not.

METHODS

Design

A cross-sectional design was used to address the aims of this study. A purposive stratified sample of two groups of AAW was evaluated: AAW enrolled in the Illinois Breast and Cervical Cancer Program (IBCCP) and AAW who were not enrolled (non-IBCCP).

Sample and recruitment

Eligible women were between 45-85 years of age, born in the USA, English speaking and reading, able to give consent,

and have access to mammograms. The minimum age limit of 45 years allowed women at least five years to have had a mammogram, consistent with current screening recommendations. A maximum age of 85 years allowed inclusion of women who remain in reasonably good health and who would be candidates for cancer treatment (American Cancer Society, 2013b; National Guideline Clearinghouse (NGC), 2012). Women in the IBCCP group were also required to have received a mammogram via the IBCCP program during a four year time period, 8/1/2006 through 8/1/2009, and to be born between 1924 and 1964. Women with a prior diagnosis of breast cancer and those referred for a screening mammogram as follow up for previously detected breast abnormalities were excluded. In addition, women were excluded if they were cognitively impaired or mentally incompetent.

Women for both groups were recruited from four zip codes within Metropolitan Chicago. AAW enrolled in the IBCCP were recruited via the Illinois Department of Public Health (IDPH), Office of Women's Health, which administers the IBCCP program. One hundred twenty questionnaire packets were mailed to IBCCP eligible women, and 19 (16%) were returned to IDPH as undeliverable. Returned packets were not replaced as the eligible population was oversampled. A total of 101 eligible IBCCP participants remained, and 51 of the 101 eligible IBCCP women returned the questionnaires for a 50% response rate. Two women recruited as non-IBCCP participants were later reclassified as IBCCP, as during the eligibility screening they revealed they had received mammograms via the IBCCP program. Thus the total number of IBCCP participants was 53, and all completed and returned questionnaires by mail.

Women not utilizing the IBCCP (non-IBCCP) were recruited from community settings (i.e. churches, hair salons, libraries, and grocery stores). Of the 87 non-IBCCP women who received a questionnaire packet, 81 responded for a 93% response rate. Seven (9%) of the women completed the questionnaires in face-to-face interviews, eight (10%) completed the questionnaires by telephone, and 66 (81%) completed the questionnaire and returned them by mail. Combined, the two groups (i.e., IBCCP and non-IBCCP) yielded a total of 134 participants.

Instrumentation and Data collection

After approval by the Loyola University Chicago Institutional Review Board (IRB) and the IDPH, Office of Women's Health IRB, data were collected by either: one-time face-to-face self-administered questionnaires, mailed questionnaires or a structured telephone interview. The independent variables were SOC, social support, spirituality and health perception. The dependent variables were BCS motivation and BCS behavior.

SOC was measured using the 29-item Orientation to Life Questionnaire (SOC-29) (Antonovsky, 1987). SOC-29 contains three subscales; comprehensibility, manageability and meaningfulness. Total SOC scores, range from 29 (weak SOC) to 203 (strong SOC). SOC-29 is reported to be a feasible, valid and reliable instrument (Antonovsky, 1993). Cronbach alphas range from 0.82 to 0.95, while test-retest correlations range from 0.78 to 0.80 (Antonovsky, 1993). For this study, Cronbach's alpha was .90, indicating good internal consistency.

Social support was measured using the Inventory of Social Support (ISS) (Hogan & Schmidt, 2002), originally developed from a study of bereaved individuals. For this study, the investigator consulted with an author of the scale, Dr. Nancy Hogan, to revise the ISS wording to be applicable to explore social support in AAW with regard to their breast

Table 1. Demographics and Mean Scores for SOC, Spirituality, Social Support, and Health Perception for Study Participants

	Total Participants N=134 (X±SD)	IBCCP Group N=53 (X±SD)	Non-IBCCP Group N=81 (X±SD)
Age	57±8.4	56±5.8	58 ±9.7
Education ^a	3.59±1.57	3.61±1.48	3.59±1.48
SES (income) ^b	.77±1.69	.40±1.31	1.00±1.85
SOC	148.30±27.52	146.23±27.87	149.69±27.04
Spirituality	53.33±7.95	52.7±9.33	53.9±6.84
Social Support	20.39±3.29	19.65±4.85	20.32±3.38
Health Perception	533.05	532.33±160.62	533.52±154.16

Abbreviations: BCS, breast cancer screening; IBCCP, Illinois Breast and Cervical Cancer Program; SES, socio-economic status-specifically income; SOC, sense of coherence
Values are mean ± SD (standard deviation)

^a Education values (1= grade school, 2 = some high school 3 = high school; 4 = some college; 5 = Associate Degree; 6 = Bachelors; 7 = graduate)

^bSES (income) values (0 = <30K; 1 = 31-40K; 2 = 41-50K; 3 = 51-60K; 4 = 61-70K; 5 = 71-80K; 6 = >81K)

health. The ISS is a 5-item scale in which respondents identify their level of agreement or disagreement with each item using anchors ranging from “does not describe me at all” to “describes me very well.” Items are summed to provide a total score with a possible range of 5 to 25; higher scores indicate greater social support. ISS measures the degree to which respondents believed there was at least one person who would take the time to listen non-judgmentally to their open and honest expression of their thoughts and feelings about breast health. Previously reported Cronbach’s alpha internal consistency for this scale was 0.76, and test-retest correlations between responses over time was 0.86, $p < .001$. The Cronbach’s alpha ($\alpha = .63$) obtained for this study suggested that the items had slightly less than desirable internal consistency. However, the ISS mean inter-item correlation was $r = .3$, which suggests adequate internal consistency of the ISS scale.

Spirituality was measured using the Spirituality Perspective Scale (SPS) (Reed, 1987), a 10-item scale that measures a person’s perspective on the extent to which spirituality pervades their lives and the extent to which they engage in spiritual related interactions. Each item is rated on a 6-point scale. Possible scores range from 1 to 6, with 6 indicating greater spiritual perspective. Reported Cronbach’s alphas ranged from 0.93 to 0.95 and inter-item correlations ranged from 0.57 to 0.68 (Reed 1987). Construct validity was demonstrated, as those reporting a religious background scored higher (Reed, 1987). Cronbach’s alpha ($\alpha = .91$) for this study indicated good internal consistency.

The SF-12v2 Health and Well-Being Survey measures perception of general health; it reflects a person’s present state

of health and not what they would like their health to be (Ware & Sherbourne, 1992). SF-12v2 assesses 8 health domains: physical functioning, role limitations due to physical problems, pain, general health, vitality, social functioning, role limitation due to emotional problems and general mental health. Higher scores indicate better health (Ware, Kosinski, Turner-Bowker, & Gandek, 2002). Reported reliability ranges from 0.70 to 0.80 (Ware, 2007). Cronbach’s alpha ($\alpha = .87$) for this study indicated adequate internal consistency.

BCS motivation was measured using the Index of Positive Motivation for Screening (IPMS) (Klassen et al., 2008). Respondents identify their level of agreement with each of 11 items using a 4-point Likert scale ranging from “big effect” to “no effect” on how much each item explains whether a woman gets breast cancer. Scores range from 14 to 52; higher scores indicate greater motivation to engage in BCS. The IPMS assesses the attitudes and beliefs of AAW about secondary prevention of cancer, as motivation for health screening is a key psychological component of health behavior (Klassen et al., 2008). Klassen et al. (2008) reported the IPMS had a Cronbach’s alpha of 0.71. Construct validity was supported in that the IPMS correlated with both time since last mammogram and intention to receive future mammograms. Cronbach’s alpha ($\alpha = .73$) for this study indicated acceptable internal consistency of items.

BCS behavior was measured using the 14-item Breast Cancer Screening Behavior Survey (BCSBS) (Conway-Phillips, 2008). Items were constructed based on an extensive literature review of BCS behaviors of AAW (Conway-Phillips & Underwood, 2009). Six dichotomous (yes versus no) BCS

behaviors were explored by assessing if a woman engaged in the behavior and, secondly, assessing a woman's intent to perform the behavior. Items included whether a woman: 1) had ever had a BSE, 2) intended a monthly BSE, 3) had ever had a CBE, 4) intended to obtain a CBE, 5) had ever had a mammogram, and 6) intended to obtain a mammogram.

Covariates evaluated were age, socioeconomic status (SES) (i.e., income and education), barriers to BCS, and breast cancer risk factors. Barriers and risk factors were assessed using the BCSBS instrument developed by the investigator, as based on the literature.

Analysis

Data were analyzed using the Statistical Package for the Social Sciences Predictive Analytic Software (version 18.0). Descriptive statistics summarized demographic and other participant characteristics. Data comparisons, using the appropriate statistical analysis (t-test for continuous variables, chi-square for categorical variables and non-parametric tests for ordinal and non-normal variables) of measurements, were done to identify differentially distributed variables and potential outliers. Alpha was set at 0.05 for all analyses.

Multiple regression models were used to analyze the relationship of SOC, social support, spirituality, and health perception to BCS motivation. Logistic regression models were used to analyze the impact of SOC, social support, spirituality, and health perception on BCS behaviors. Potential confounders (covariates); age, SES, barriers to BCS, and breast cancer risk

factors were identified *a priori* based on the literature and were included in the logistic regression model analysis of BCS behaviors. Independent t-tests, chi-square (χ^2) and logistic regression were used to determine differences in SOC, social support, spirituality, and health perception between AAW who utilize free mammogram screening programs and those who do not.

RESULTS

One hundred and thirty four AAW participated in the study (mean age = 57 years, $SD = 8.4$). See Table 1 for demographic characteristics. Women in the IBCCP group were similar in age as those in the non-IBCCP group, 56 ± 5.8 and 58 ± 9.7 years, respectively. Also, the groups did not differ significantly in education, income, religion, or reproductive characteristics.

Influence of SOC, Social Support, Spirituality and Health Perception on BCS Motivation

Initially, SOC was evaluated as a single predictor in a regression model to determine whether it predicted BCS motivation. Results revealed that SOC significantly predicted BCS motivation, ($b = .069$ ($SE = .018$), $t(129) = 3.919$, $p = < .001$). However, when SOC was included in the model containing the other study variables (social support, spirituality and health perception), the relationship was no longer significant, $b = .03$ ($SE = .03$), $t(63) = .92$, $p = .36$.

Table 2: Results of Regression Analysis of Individual Characteristics on Breast Cancer Screening Motivation in African American Women (N=134)

Variable	B	SE B	β	t	p value
SES	.36	.41	.10	.86	.39
Education	.94	.44	.24	2.13	.04
Age	.01	.08	.01	.07	.94
Risk	-.40	.78	-.05	-.51	.61
Barriers to Screening	.94	1.56	.06	.60	.55
Sense of Coherence 29	.03	.03	.13	.92	.36
Social Support	.33	.21	.20	1.57	.13
Spirituality	.30	.09	.37	3.25	.002
Health Perception	-.01	.01	-.19	-1.55	.13
R^2		.27			
F		4.001 ^a			

^a $p < .01$

Table 3: Differences in Breast Cancer Screening Behaviors Reported by IBCCP and Non-IBCCP Groups

Behavior	Group				χ^2
	IBCCP Reported Behaviors		Non-IBCCP Reported Behaviors		
	Yes	No	Yes	No	
Has Performed a Breast Self-Exam (BSE)	47 (88.7%)	6 (11.3%)	25 (73.5%)	9 (26.5%)	3.33 ^b
Intends BSE Monthly	51 (96.2%)	2 (3.8%)	28 (82.4%)	6 (17.6%)	4.77 ^c
Has had a Clinical Breast Exam (CBE)	49 (92.5%)	4 (7.5%)	29 (85.3%)	5 (14.7%)	1.14
Intends to Obtain CBE	51 (96.2%)	2 (3.8%)	29 (85.3%)	5 (14.7%)	3.35 ^b
Has had a Mammogram	51 (98.1%)	1 (1.9%)	24 (70.6%)	10 (29.4%)	13.93 ^d
Intends Mammogram	52 (100%)	0 (0%)	31 (93.9%)	2 (2.4%)	3.23

^a Values are category frequencies with percentage in parentheses. Each χ^2 test used a single degree of freedom.
^b $p < .07$.
^c $p < .05$.
^d $p < .01$.

Initial analysis revealed that SOC was significantly correlated with social support ($r = .39, p < .001$), spirituality ($r = .36, p < .001$) and health perception ($r = .52, p < .001$). A multiple regression model was then used to examine the contributions of SOC, social support, spirituality, and health perception to a woman's motivation to practice BCS. Results revealed that the full model explained a significant portion (27%) of the variance in motivation scores, $R^2 = .27, F(9, 63) = 4.00, p < .001$ (Table 2); however, of the predictors evaluated, only spirituality emerged as a significant predictor of an increase in BCS motivation, $b = .30 (SE = .09), t(63) = 3.25, p = .002$. Of the covariates evaluated, only level of education significantly contributed to BCS motivation, $b = .94 (SE = .44), t(63) = 2.13, p = .037$ (Table 2).

Influence of SOC, Social Support, Spirituality and Health Perception on BCS Behaviors

An evaluation of the predictor variables (i.e., SOC, social support, spirituality, and health perception) on BCS behaviors revealed that none of these variables were significant predictors of BCS behaviors (data not shown). Additional analysis sought to identify if SOC, social support, spirituality, and/or health perception combined with covariates age, socioeconomic status (SES), education, risk factors for developing breast cancer and barriers to BCS predicted whether or not a woman engaged in the specific BCS behaviors, (i.e. BSE, CBE, mammogram). Results from logistic regression demonstrated that if a woman reported barriers to BCS, there was an associated decrease in the odds that she would perform a BSE, $b = -3.73, SE = 1.54, p = .015$; barriers to BCS were associated with a 98% decrease

in the odds that a woman has ever performed a BSE. Also, a trend was observed such that as a woman's general health perception increased, the odds that she would perform BSE increased, $b = .01, SE = .01, p = .06$. Identification of barriers to BCS also significantly reduced the odds that a woman intended to perform monthly BSE, $b = -3.43, SE = 1.56, p = .028$. If a woman reported barriers to screening, the odds that she intended to perform monthly breast self exams decreased by 97%.

Findings revealed a marginally significant effect of barriers to screening on obtaining a CBE. Those findings showed that if a woman identified barriers, there was an 89% decrease in the odds that she would have obtained a CBE, $b = -2.25, SE = 1.16, p = .052$. SES, education, age, barriers, risk of developing breast cancer, health perception, spirituality, SOC and social support were analyzed to determine whether these factors influenced whether a woman intends to obtain a CBE. This analysis revealed three trends. First, a woman's risk of developing breast cancer was associated with a 99% decrease in the odds that she intends to obtain a CBE, $b = -4.61, SE = 2.56, p = .072$. Second, increases in general health perception were associated with an increase in the odds that a woman intends to obtain a CBE, $b = .02, SE = .01, p = .10$. Finally, increases in social support were associated with a 118% increase in the odds that a woman intends to obtain a CBE, $b = .78, SE = .44, p = .07$.

Statistically significant results were found when testing the combined effect of the covariates and predictors on whether a woman has had a mammogram and whether she intends to obtain one ($\chi^2(9) = 50.92, p \leq .0001$ and $\chi^2(9) = 18.44$,

$p = .03$ respectively). Yet, no single variable in this model independently predicted if a woman had or if she intended to have a mammogram.

Differences between IBCCP and non-IBCCP groups

No significant differences were observed in mean levels of SOC, social support, spirituality, health perception or BCS motivation for the two groups of women, (Table 1). However, significant differences were observed between the two groups regarding BCS behaviors. The findings revealed that the IBCCP women were significantly more likely to *intend* to perform a monthly BSE and were also more likely to have had a mammogram than the non-IBCCP women ($\chi^2 = 4.77, p = .029$ and $13.93, p < .0001$, respectively) (Table 3). Findings also revealed a marginal effect in that IBCCP women were slightly more likely to have performed a BSE and to *intend* to have a CBE than non-IBCCP women ($\chi^2 = 3.33$ and 3.35 , both $ps < .07$).

DISCUSSION AND MAJOR CONCLUSIONS OF THE STUDY

The salutogenic model views individuals as being on a health continuum with a tendency toward the health end of the continuum rather than the disease end. In that vein, SOC in combination with GRRs are key constructs that contribute to movement along the health continuum. As applied to this study, SOC is an innate quality of a woman to comprehend her risk (high breast cancer mortality rate), to assess and utilize available resources (social support, free mammography screening programs) and to accomplish what is needed to stay healthy (breast cancer screening). Findings revealed that SOC significantly predicted BCS motivation when evaluated independently, but not when evaluated in the full regression model that included the GRRs (i.e., spirituality, social support, and health perception). Moreover, of the GRRs evaluated, spirituality emerged as the sole significant predictor of BCS motivation. This finding is consistent with other reports that AAW with greater spirituality are more likely to use health services and practice health behaviors (Banning, 2011; Dessio et al., 2004; Gullatte et al., 2010; Holt et al., 2008; Katz et al., 2008). Thus, these findings suggest that any influence of SOC on BCS motivation likely overlaps with that conferred by spirituality. Others also find spirituality to be positively related to SOC. For example, breast cancer survivors who reported higher levels of SOC also expressed greater hope and a stronger spiritual perspective; both of which positively impacted their psychological well-being. Further, inner resources, like SOC, were posited to influence the success of individual's responses to prescribed health interventions (Gibson, 2003).

Although no previous studies explored the influence of SOC on BCS behavior in AAW, others show SOC to positively influence health behaviors among at risk AAW (Nyamathi, 1993). For example, in homeless, drug-abusing AAW, those with a stronger SOC were less likely to report emotional distress, to have fewer high-risk behaviors and to appraise stressful situations as less threatening than those with weak SOC. Also, AAW with strong SOC reported high self-esteem and fewer somatic complaints (Nyamathi, 1993). In our sample of AAW, levels of SOC were high, which may have limited our ability to find significant relationships with study outcomes. Further, the sample of AAW in this study were highly motivated to perform BCS, with scores 10 points higher than that reported by Klassen et al. (2008). Also, compared to normative values (Hogan & Schmidt, 2002; Reed, 1987), women in our sample reported high levels of social support, spirituality, and health perception.

Despite not finding SOC to significantly predict BCS in the full regression model, finding that spirituality did predict BCS motivation is relevant to salutogenesis as spirituality,

as well as social support, are key factors (i.e., GRR) that can motivate an individual to take advantage of available resources (Antonovsky, 1987); in this case to access resources and to engage in activities to promote breast health. Also, our findings reveal a strong relationship between SOC and spirituality, suggesting that spirituality may enhance one's SOC. From this perspective, our findings are congruent with the salutogenic model and consistent with prior studies that found spiritually to positively influence BCS behaviors (Fowler, 2007; Underwood & Powell, 2006). However, the independent influence of SOC on BCS remains to be determined in future studies that enroll AAW with more varied levels of SOC.

Other findings of this study emphasize the importance of general health perception to increase the odds that a woman intends to practice BSE and obtain a CBE. Findings also revealed that AAW reporting higher social support were more likely to have had a CBE, highlighting the potential role of social networks as a means to promote breast health education and behaviors. In addition, we found that those AAW who had a risk of developing breast cancer were less likely to *intend* to obtain a CBE. This finding underscores the important role of health care providers to identify and discuss breast cancer risk with AAW and to follow-up those women at greater risk. Although barriers were not the focus of this study, our findings confirm that barriers decrease the likelihood that women will participate in one or more of the BCS activities (Peek, Sayad, & Markwardt, 2008). Moreover, this occurred despite knowledge of breast health promoting activities. In this study, the most frequently identified barriers were lack of health insurance, pain and/or fear, and lack of time. Overall, these findings emphasize the need to develop better strategies to reduce barriers that limit adoption of BCS behaviors.

LIMITATIONS

It is recognized that other unmeasured variables may also strongly affect BCS motivation and behaviors of AAW, including attitudes, beliefs, knowledge, perception and decision making. Larger studies with greater sample diversity are needed to evaluate these additional variables. Also, a larger sample size would yield greater variance in BCS behaviors, increasing power to more fully elucidate the influence of individual characteristics on BCS behaviors within each group (IBCCP and non-IBCCP). Women in this study resided within four zip codes of metropolitan Chicago, limiting generalizability to the greater ethnic, economic and educational diversity of Chicago. However, understanding breast cancer disparity for AAW in Chicago is critical, as certain areas within this city have the highest national breast cancer mortality rate (Grabler, Dupuy, Rai, Bernstein, & Ansell, 2012). Findings are also limited in that BCS behaviors were self-reported, which is less reliable, as AAW tend to over-report BCS activities (Powe & Cooper, 2008). Further, most women in this study reported that they practiced BCS behaviors, possibly contributing to a 'ceiling effect' that limits range of this measure. Moreover, it is possible that women with higher BCS behaviors self-selected to participate in this study.

IMPLICATIONS AND FUTURE STUDY

A key study finding was the positive impact of spirituality on BCS. This finding is consistent with the salutogenic model, as spiritual-based supportive/ social networks within the community can provide GRRs (resources) to help educate and motivate AAW to practice BCS and to utilize BCS resources. Given the importance of spirituality to the African American community (Banning, 2011; Holt et al., 2008), implementing breast health programs within faith-based organizations may yield better BCS rates, which can reduce breast cancer mortality in AAW. Also, this finding suggests that future research should continue to address the important role of spirituality as related

to health behaviors among AAW. Such research can provide a foundation for the development of culturally relevant breast health programs for AAW.

Although barriers were not the focus of this study, barriers emerged as a significant deterrent to perform BSE, the simplest, cost free early detection procedure. This was true even when women were motivated to practice BCS behaviors, thus highlighting the boundaries of motivation. Studies exploring the impact of motivation on BCS behaviors are critical to identify motivating factors in AAW of all income levels. Yet, motivation is sometimes not enough to overcome barriers to perform BCS behaviors. This highlights the key role of nurses to develop health promotion programs focused on motivating women to practice BCS and to also consider potential barriers that would negate the positive impact of motivational programs. Future studies enrolling a larger sample with greater variance in SOC and BCS behaviors are needed to more adequately address the role of SOC in BCS behaviors, as well as the interaction between spirituality and SOC on these behaviors. The present findings do support the value of free mammography programs to reduce breast cancer disparity in AAW. Nurses working with AAW need to consider the following: Does participation in such programs change a woman's intent to take part in BCS; or is there a pre-existing inner characteristic driving them to enroll in such programs? Undoubtedly, enrolling in such a program implies that these women value their health. Yet, it is important to further explore factors that motivate women to take advantage of free health promotions programs and other resources that improve access to BCS services. Such understanding can guide approaches to reduce breast cancer mortality in AAW.

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